

What is claimed is:

1. A device for detecting a position and an orientation of an insertion portion of a medical insertion tool inside a body cavity by means of a magnetic field generating means and a magnetic field detecting means characterized in that

the magnetic field generating means is attached to the insertion portion of the medical insertion tool; the magnetic field generating means is made of a permanent magnet or a ferromagnetic body which can generate a magnetic field without applying an electric current to a conductor; and the magnetic field detecting means is disposed outside the body cavity, and the magnetic field detecting means including plural magnetic sensors having triaxial directivity to the magnetic field to be detected, each of the magnetic sensors having triaxial directivity being formed by combining plural sensors respectively having uniaxial directivity.

2. A device for detecting a position and an orientation of an insertion portion of a medical insertion tool inside a body cavity according to claim 1, wherein the magnetic field detecting means includes at least three magnetic sensors having triaxial directivity which are equally spaced around a scope to be detected.

3. A device for detecting a position and an orientation of

an insertion portion of a medical insertion tool inside a body cavity according to claim 1, wherein the magnetic sensor of the magnetic field detecting means is a magneto-impedance effect element.

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4. A device for detecting a position and an orientation of an insertion portion of a medical insertion tool inside a body cavity according to claim 2, wherein the magnetic sensor of the magnetic field detecting means is a magneto-impedance effect
10 element.

5. A device for detecting a position and an orientation of an insertion portion of a medical insertion tool inside a body cavity according to claim 1, wherein the medical insertion tool
15 is selected from among indwelling tools inside the body cavity such as a catheter, a guide wire, an endoscope or a drainage tube, a biliary stent, a high calorie transfusion tube.

6. A device for detecting a position and an orientation of
20 an insertion portion of a medical insertion tool inside a body cavity according to claim 2, wherein the medical insertion tool is selected from among indwelling tools inside the body cavity such as a catheter, a guide wire, an endoscope or a drainage tube, a biliary stent, a high calorie transfusion tube.

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7. A device for detecting a position and an orientation of an insertion portion of a medical insertion tool inside a body cavity according to claim 3, wherein the medical insertion tool is selected from among indwelling tools inside the body cavity
5 such as a catheter, a guide wire, an endoscope or a drainage tube, a biliary stent, a high calorie transfusion tube.

8. A device for detecting a position and an orientation of an insertion portion of a medical insertion tool inside a body
10 cavity according to claim 4, wherein the medical insertion tool is selected from among indwelling tools inside the body cavity such as a catheter, a guide wire, an endoscope or a drainage tube, a biliary stent, a high calorie transfusion tube.

15 9. A method of detecting a position and an orientation of an insertion portion of a medical insertion tool inside a body cavity by means of a magnetic field generating means and a magnetic field detecting means comprising the steps of:

generating a magnetic field through the magnetic field
20 generating means made of a permanent magnet or a ferromagnetic body attached to the insertion portion without applying an electric current to a conductor, in a state wherein the insertion portion thereof is inserted inside the body cavity,

measuring the generated magnetic field by means of the
25 plural magnetic sensors having the triaxial directivity to the

magnetic field to be detected, which are disposed outside the body cavity, each of the magnetic sensors having triaxial directivity being formed by combining plural sensors respectively having uniaxial directivity and

5 detecting a three dimensional position and a three dimensional orientation of the insertion portion of the medical insertion tool.

10. A method of detecting a position and an orientation of
10 an insertion portion of a medical insertion tool inside a body cavity according to claim 9, wherein the magnetic field detecting means includes at least three magnetic sensors having triaxial directivity which are equally spaced around a scope to be detected.

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11. A method of detecting a position and an orientation of an insertion portion of a medical insertion tool inside a body cavity according to claim 9, wherein a magneto-impedance effect element is used as the magnetic sensor of the magnetic detecting
20 means.

12. A method of detecting a position and an orientation of an insertion portion of a medical insertion tool inside a body cavity according to claim 10, wherein a magneto-impedance effect
25 element is used as the magnetic sensor of the magnetic detecting

means.